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connected with the geometrical truths as they are established, and also to see how the algebraic notation leads to concise proofs.

Among the noticeable features of this textbook are the following: constructive problems to open up the subject; the large number of exercises; the use of the principles of congruency; many proofs given in outline, or left entirely to the pupil; early use of circles; early use of ratio and proportion; the simple treatment of incommensurables and limits; the properties of proportion developed by means of exercises; applications of similar triangles; trigonometric ratios, and their use in solving right triangles; similarity and proportionality in circles; solution of quadratic equations; inequality in triangles and circles brought together in one chapter; new methods in the treatment of areas of polygons; use of the graph; degree of rigor suited to the ability of high-school pupils.

Though the present volume and the revised edition of the *First-Year Mathematics* mark a great advance in secondary textbooks, it would seem that they could be used in any school where the teachers are interested in making their work more efficient.

Practical Curve Tracing. By R. HOWARD DUNCAN. London: Longmans, Green & Co., 1910. Pp. vi+133. \$1.60.

Some ten years ago the graph began to appear in the algebraic work of the secondary schools. It was introduced and used solely to represent equations in two variables, to solve simultaneous and quadratic equations, and to discuss their roots. Soon this one use of the graph was over-developed and there was a protest on the part of some teachers against the use of squared paper. But the teacher who has discovered the efficiency of squared paper in picturing tables of values, in solving problems, and in representing the results of experiments and deducing formulas to express these results, will see to it that his pupils learn to use this powerful instrument.

The present volume aims to present in an orderly manner the methods of curve-plotting and at the same time to make the student familiar with the properties of the chief families of curves. Much attention is given to methods of plotting curves quickly and accurately and to a discussion of the properties and characteristics of the curves themselves. Nevertheless, the practical side is not overlooked; many problems are solved in full, and a list of one hundred and twenty-five problems from the field of physics and engineering gives the student practice in applying the principles of curve-plotting.

The topics considered are: curve plotting from given data and from an equation; the straight line; the parabolic family; the hyperbolic family; the exponential family; the logarithmic family; the sine curve; the graphical solution of equations; the slope of a curve—differentiation; the area of a curve—integration. There are a large number of carefully-drawn diagrams accompanied by clear and detailed explanations.

The study of this book might well replace some of the purely academic mathematics of the first year in colleges and engineering schools. It is a valuable reference book for secondary-school teachers, and should be in every high-school library.

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